

CLAIMS

What is claimed is:

- 1 1. A method of analyzing a medical image obtained from one of a
2 plurality of modalities, the method comprising:
3 normalizing the medical image to create a uniform image quality for
4 image analysis regardless of the original source of the image.
- 1 2. The method of claim 1, wherein the medical image is in a DICOM
2 format for flexibility in communication with devices.
- 1 3. The method of claim 2, further comprising:
2 converting the medical image to a DICOM format.
- 1 4. The method of claim 1, further comprising:
2 detecting what anatomical feature is represented by the image; and
3 processing the image to detect abnormalities in the anatomical feature, in
4 accordance with a detection process for that anatomical feature.
- 1 5. The method of claim 4, wherein detecting what anatomical feature
2 is represented uses a header present in a DICOM format of the image.
- 1 6. The method of claim 1, further comprising:
2 generating a new tone scale images for the image for optimal visualization
3 of abnormalities in dense anatomic regions.

1 7. An apparatus to improve medical imaging comprising:
2 an image analysis system to normalize a medical image to create a
3 uniform image quality regardless of an original format of the image, permitting a
4 single analysis algorithm to be used on all images regardless of original format.

1 8. The apparatus of claim 7, further comprising:
2 an image acquisition module to acquire a medical image in one of a
3 plurality of modalities.

1 9. The apparatus of claim 8, wherein the image acquisition module is
2 coupled to the image analysis system through a network.

1 10. The apparatus of claim 7, further comprising:
2 a review station to allow medical personnel to review the medical image
3 after analysis.

1 11. The apparatus of claim 10, wherein the review station is coupled to
2 the image analysis system through a network.

1 12. The apparatus of claim 11, wherein the review station comprises:
2 a user interface permitting the reviewer to manipulate the contrast and
3 windowing of the image.

1 13. The apparatus of claim 11, further comprising:

marker focus system to permit a reviewer to automatically move from marked location to marked location on the medical image, wherein each marked location corresponds to an abnormality detected by an abnormality detection system.

14. The apparatus of claim 7, further comprising:
a system archive to store the medical images, including historical images
of past procedures.

15. The apparatus of claim 7, wherein the image analysis system further comprises a pre-processing module.

16. The apparatus of claim 15, wherein the pre-processing module comprises a pixel size adjustor to adjust a number of pixels per square inch.

17. The apparatus of claim 15, wherein the pre-processing module comprises a segmentation logic to segment the medical image.

18. The apparatus of claim 7, wherein the image analysis system further comprises a post-processing module.

19. The apparatus of claim 18, wherein the post-processing module includes a tone scale generator to adjust a tone scale to optimize viewing of dense portions of the medical image.

1 20. A system comprising:
2 a source of image data, each image in the image data having one of a
3 multiplicity of spatial resolutions and a multiplicity of contrast responses;
4 a preprocessing module to transform the image data into
5 “canonical” forms with uniform contrast response, overall level and pixel
6 size;
7 such that the image analyzed by a computer aided diagnosis system has a
8 uniform contrast response regardless of the original source of the image.

1 21. The system of claim 20, further comprising:
2 a post-processing module to modifying a tone-scale of the image to
3 improve visibility of suspicious regions.

1 22. The system of claim 20, further comprising:
2 a CAD module to process said data to detect abnormal anatomical
3 features meeting selected criteria.

1 23. The system of claim 22, further comprising:
2 a display to selectively display annotation maps at positions
3 corresponding to suspicious regions around the abnormal anatomical features
4 detected by the CAD module.

1 24. The system of claim 20, further comprising:
2 a remote display to permit access to the processed image via a network.

1 25. The system of claim 20, further comprising:
2 a network coupled to the system, the network permitting a distribution of
3 processing to multiple computing devices.

1 26. A system comprising:
2 a source of image data;
3 a CAD module to process the data to detect abnormal anatomical
4 features meeting selected criteria and to flag the abnormal anatomical
5 features as suspicious regions;
6 a post-processing module to modify a tone-scale of the image to increase
7 visibility of the suspicious regions.

1 27. The system of claim 26, further comprising:
2 a window generation logic to open a separate window on a display to
3 display a suspicious region; and
4 the post-processing module optimizing the tone-scale for the separate
5 window.

1 28. A system comprising:
2 a source of image data said image data having a multiplicity of spatial
3 resolutions and a multiplicity of contrast responses;
4 a preprocessing module transforming the multiplicity of image
5 data into "canonical" forms with uniform contrast response and overall
6 level and pixel size;

05809.P001

7 a CAD module to process said data to detect abnormal anatomical
8 features meeting selected criteria and to generate annotation maps
9 identifying image portions corresponding to said abnormal anatomical
10 features;
11 a post-processing module to modify a tone-scale of the image to increase
12 visibility of the suspicious regions associated with the abnormal anatomical
13 features; and
14 a display to selectively display annotation maps at positions
15 corresponding to suspicious regions.

1 29. The system of claim 28, wherein the CAD module is further to
2 generate a DICOM CAD SR object.

1 30. The system of claim 29, wherein the CAD module is further to send
2 the DICOM CAD SR object to the network.

1 31. The system of claim 29, wherein the DICOM CAD SR object is used
2 by the display to display the annotation map.